DB Name	Query	Hit Count	Set Name
USPT,JPAB,EPAB,DWPI,TDBD	l9 with billing$	42	L17
USPT,JPAB,EPAB,DWPI,TDBD	l14 same (billing)	2	L16
USPT,JPAB,EPAB,DWPI,TDBD	l14 with (billing)	0	L15
USPT,JPAB,EPAB,DWPI,TDBD	(measur$) with l9	7481	L14
USPT,JPAB,EPAB,DWPI,TDBD	(billing) with (speed with data)	60	L13
USPT,JPAB,EPAB,DWPI,TDBD	(billing with rat$) with (speed with data)	2	L12
USPT,JPAB,EPAB,DWPI,TDBD	l10 and (379/$.ccls. or 324/$.ccls.)	8	L11
USPT,JPAB,EPAB,DWPI,TDBD	l6 same l9	157	L10
USPT,JPAB,EPAB,DWPI,TDBD	(line$1 or modem$1) with (model$1 or characteristic$ or propert$ or parameter$)	126311	L9
USPT,JPAB,EPAB,DWPI,TDBD	l6 same l7	13	L8
USPT,JPAB,EPAB,DWPI,TDBD	(measur$) with ((line$ or modem$) with model$)	1282	L7
USPT,JPAB,EPAB,DWPI,TDBD	(predict$ with perform$)	14653	L6
USPT,JPAB,EPAB,DWPI,TDBD	l2 and ((telephone or phone or subscriber or communication$1) with line$1)	1	L5
USPT,JPAB,EPAB,DWPI,TDBD	l2 same(line$1)	26	L4
USPT,JPAB,EPAB,DWPI,TDBD	l2 and (line$1)	26	L3
USPT,JPAB,EPAB,DWPI,TDBD	l1 with (perform$)	26	L2
USPT,JPAB,EPAB,DWPI,TDBD	(measur$) with ((line or modem) with model$)	789	L1

Weston

File: USPT

Aug 25, 1998

DOCUMENT-IDENTIFIER: US 5799069 A

TITLE: Method and apparatus for dynamically adapting the clock rate and data transfer rate of phone-line powered modems.

ABPL:

Methods and apparatus are disclosed for detecting the amount of the power available from a phone line and for adjusting the clock rate and data transfer rate of a modem or a device that transfers data over the phone line to provide the best possible performance for the available phone-line power. A method of operating a device for transferring data over a phone line includes the following steps: setting the device off hook; measuring the voltage level of the phone line; determining the amount of the power available from the phone line; selecting a clock rate for the device; setting the device to operate at the clock rate; placing a call; selecting a data transfer rate; and transferring the data. An apparatus for transferring data over a phone line includes a clock generator for generating a first clock signal of a first frequency; a frequency divider for generating multiple clock signals of different frequencies and for outputting one of the multiple clock signals; a data pump for modulating and demodulating data; a sensor for sensing the voltage level of the phone line; a microcontroller for controlling the frequency divider, the data pump and the sensor; a line isolator for blocking hazardous electrical signals from coming into the apparatus; an interface for coupling the microcontroller to a computer host; and a power converter for converting a DC voltage of the phone line to an appropriate DC power supply voltage to be used by the apparatus.

BSPR:

According to the present invention, a method of operating a modem or a device for transferring data over a phone line includes the following steps: setting the modem off hook; measuring the voltage level of the phone line; determining the amount of the power available from the phone line; selecting a clock rate for the modem; setting the modem to operate at the clock rate; placing a call; selecting a data transfer rate; and transferring the data at the selected data transfer rate.

BSPR:

The microcontroller of the present invention operates as follows: The microcontroller directs the sensor to measure the voltage level of the phone line. Once the sensor sends the measured data to the microcontroller, the microcontroller determines the appropriate clock rate to be used for the data pump. The microcontroller sends a control signal to the frequency divider to output the clock signal corresponding to the appropriate clock rate and another control signal to the data pump so that the data pump can be set up to operate at that clock rate.

DEPR:

It should be noted that the data transfer rate is determined not only by the amount of the power available to the modem but also by the quality of the phone line. If the amount of the available power is high, and the quality of the phone line is good, then the modem can transfer the data at a high rate. If the amount of the available power is high, but the quality of the phone line is bad, then the data transfer occurs at a low data transfer rate. In addition, if the quality of the phone line is good, but the amount of the available power is low, then the data transfer again occurs at a low data transfer rate.

DEPR:

FIG. 4a is a flow chart showing the operation of a prior art modem that has essentially "unlimited" power available to the modem. Such modems include, but are not limited to, those that are used with non-portable computers and those shown in FIGS. 1a-1b. In the example shown in FIG. 4a, because the amount of the power available to the modem is high (or "unlimited"), the data transfer rate is determined only by the quality of the phone line. In FIG. 4a, at step 80, the modem places a call. Steps 82-86 are used to check the quality of the phone line. At step 82, the modem attempts to make a connection at 14400 bits-per-second. If successful, then the modem transfers data.

DEPR:

If, on the other hand, there is a lot of noise, distortion or interference in the phone line, the modem determines that the data transfer rate of 14400 bits-per-second is too high and attempts to establish a connection at a lower data transfer rate. It should be noted that the quality of the phone line connection is independent of the amount of power available from the phone line. The quality of the phone line is determined by the amount of noise, distortion and/or interference present in the line and not by the amount of the power available. The quality of the phone can be good or bad regardless of the amount of the power available. At step 84, the modem determines whether the quality of the phone line is good enough for 4800 bits-per-second. If it is, data is transferred. Otherwise, the modem tries to connect at 2400 bits-per-second. If the 2400 bits-per-second rate fails, then the process is aborted.

DEPR:

FIG. 4b is a flow chart showing the operation of a prior art modem powered mainly by a phone line, such as those shown in FIGS. 1c-1e. In the case shown in FIG. 4b, because the amount of the power available to the modem is small for a long subscriber loop--although the amount of the power available to the modem is high for a short subscriber loop length, the prior art modem has a fixed low data transfer rate (e.g., 2400 bits-per-second) so that the modem can be used for both short and long subscriber loop lengths. In the prior art, the data transfer rate is fixed to the lowest data transfer rate since the modem does not have the capabilities

to determine the amount of the power available from the phone line and to set the modem communication rate accordingly. At step 90, the modem places a call.
At step 92, the modem checks whether the quality of the phone line connection is good enough to transfer data at 2400 bits-per-second. If the modem can make a connection at 2400 bits-per-second, then data is transferred. Otherwise, the data transfer is aborted.

CLPV:
a sensor coupled to the phone line, said sensor sensing the amount of the power available from said phone line and enabling said apparatus to transfer data at a rate greater than 2400 bits-per-second when said sensor determines sufficient power available from said phone line; and

CLPW:
a frequency divider coupled to said clock generator for generating multiple clock signals of different frequencies, at least one of said clock signals enabling said apparatus to transfer data at a rate exceeding 2400 bits-per-second when said sensor determines sufficient power is available from said phone line; said frequency divider configured to output a selected one of said multiple clock signals;

CCOR:
379/93.33

CCXR:
379/93.26

CCXR:
379/93.31

L4: Entry 24 of 57

File: USPT

Jun 18, 1996

DOCUMENT-IDENTIFIER: US 5528679 A
TITLE: Automatic detection of digital call paths in a telephone system

BSPR:
The present invention provides an apparatus and method for allowing a first subscriber to automatically determine whether digital operation is supported by a link to a second subscriber after establishing the link, and the highest data rate supported by the link. The present invention also provides a method and apparatus for allowing a subscriber on a BRI to originate 56 kbps or 64 kbps digital calls to, and receive calls from, other subscribers having such digital capability. Still further,

the present invention allows a subscriber on an ISDN to originate a call to a subscriber who is capable of communication only by analog modulation schemes without placing a first call that will fail and then having to make a second call, and without knowing the capabilities of the subscriber prior to placing the call.

CCOR:
379/34

CCXR:
379/1

CCXR:
379/93.01

L4: Entry 49 of 57

File: USPT

Mar 24, 1981

DOCUMENT-IDENTIFIER: US 4258433 A
TITLE: Digital data communication network having differing data transmission rate capabilities

ABPL:
The invention relates to method of interconnecting terminal devices in a digital telephone network wherein either the terminal devices in question normally operate at different data rates or they are to be interconnected over data links in the network which normally operate at different data rates. The method involves firstly determining, by processor means at a switching point in the network, the normal data bit rate of two terminals to be interconnected as well as the normal data bit rate of the or each data link over which the connection is to be made. In the case where there is a difference in the normal data bit rates the processor initiates a procedure to send a digital bit stream to one or both of the terminals to cause the terminals to operate, in the course of the connection, at a common data rate equal to the lowest of the normal data bit rates of said terminals and said data link. A telephone adapted to operate at different data rates in response to receiving a digital bit stream at the new rate or a digital code word is also described and claimed

CLPR:
2. A method as defined in claim 1 wherein said network is a telephone network and said terminals are digital telephones which are slaved to a said switching point in the system network such that clock signal at each telephone is derived from digital data sent thereto from a said switching point which is a master switching point to the telephone, characterized in that, said step of determining the relative data rates of the first (calling subscriber) and second (called subscriber) terminals

and the data link comprises utilizing said processor to interrogate a called subscriber identification table to determine the normal data bit rate capabilities of the called subscriber and any data link necessary in the connection and compare the information obtained from said identification table with information relevant to the normal data rate of the calling subscriber as apparent from digital data received at said switching point when said calling subscriber initiates a call and the digital bit stream sent to a telephone to alter the data bit rate is data at the new bit rate which causes the telephone to operate at the new data bit rate.

CCXR:
379/93.08

CCXR:
379/93.14

L4 ANSWER 1 OF 9 INSPEC COPYRIGHT 2000 IEE

AB This article presents an approach to providing very high- ***data*** - ***rate*** downstream Internet access by nomadic users within the current CDMA physical layer architecture. A means for considerably increasing the throughput by optimizing packet data protocols and by other network and coding techniques are presented and supported by simulations and laboratory ***measurements*** . The network architecture, based on Internet protocols adapted to the mobile environment, is described, followed by a discussion of economic considerations in comparison to cable and DSL services.

ST high speed wireless data service; nomadic users; bandwidth efficient data service; CDMA/HDR; downstream Internet access; CDMA physical layer architecture; throughput; packet data protocols; coding techniques; simulations; ***laboratory measurements*** ; network architecture; Internet protocols; mobile environment; economic considerations; DSL services; cable services; ***digital subscriber line*** ; tariff; IP

L4 ANSWER 2 OF 9 INSPEC COPYRIGHT 2000 IEE

AB This paper presents a very high-speed digital ***subscriber*** ***line*** (VDSL) solution called synchronized discrete multi-tone (SDMT), which is a flexible, low-complexity time-division duplexed implementation of DMT that provides key desirable VDSL features. The ***measured*** performance results quantify the achievable ranges and ***data*** ***rates*** of a currently-available SDMT VDSL system.

CT DIGITAL ***SUBSCRIBER*** ***LINES*** ; MODEMS; MODULATION

ST synchronized DMT modems; SDMT modems; modem performance; modem design; ***very high-speed digital subscriber line*** ; synchronized discrete multi-tone; ***measured performance results*** ; low-complexity time-division duplexed implementation; ***data rates*** ; ranges; SDMT VDSL system; DMT modulation

L4 ANSWER 3 OF 9 INSPEC COPYRIGHT 2000 IEE

AB This paper presents a comparison of two different modulation schemes, 16QAM and multitone, for transmitting high-bit-rate data over category 5 twisted pair ***lines*** using asymmetric digital ***subscriber*** ***line*** (ADSL) technology. A channel model is obtained from ***measurement*** results of a 1000-foot category 5 twisted pair. The performances for 16QAM and multitone are simulated with the ***measured*** channel model at two ***data*** ***rates*** 2.05 Mbit/s (for MPEG1) and 10.24 Mbit/s (for MPEG2). For comparison, both the 16QAM and multitone schemes occupy the same frequency bands. Symbol error rates are obtained under different receiver configurations and signal-to-noise ratios. It is found that 16QAM and multitone have similar performance over category 5 twisted pairs which have a rather flat frequency response. The modulation scheme that should be adopted is hence dependent on the implementation cost and complexity.

CT DATA COMMUNICATION; DIGITAL ***SUBSCRIBER*** ***LINES*** ; ERROR
STATISTICS; FREQUENCY RESPONSE; QUADRATURE AMPLITUDE MODULATION;
RECEIVERS; TWISTED PAIR CABLES

ST 16QAM; short-haul ADSL systems; multitone modulation; high-bit-rate data transmission; category 5 twisted pair; ***asymmetric digital subscriber*** *** line*** ; performance; MPEG1; MPEG2; symbol error rates; receiver configurations; signal-to-noise ratios; frequency response; implementation cost; complexity

L4 ANSWER 4 OF 9 INSPEC COPYRIGHT 2000 IEE

AB With a hybrid fiber/twisted-pair architecture, ***data*** ***rates*** up to about 50 Mbit/s can be transmitted over installed twisted-pair cables in the distribution part of twisted-pair access networks. Based on a channel model for twisted-pair cables for frequencies up to 40 MHz derived from ***measurements*** , different transmission formats are compared. It is concluded that frequency division multiplexed VDSL (Very high bit rate Digital ***Subscriber*** ***Line***) systems based on QAM (Quadrature Amplitude Modulation) or CAP (Carrierless AM/PM) are a good choice. In this paper, two scalable system proposals are presented. Both systems can transmit 12.5 Mbit/s symmetrically over a distance of about 800 m. System 1 enables as well the asymmetrical transmission of 50/2 Mbit/s over 280 m, whereas system 2 enables the symmetrical transmission of 25 Mbit/s over 300 m. Based on the required filter lengths of the equalizer and the wordlengths of the signals within the adaptive filters, the hardware complexity of the proposed VDSL transceivers is determined.

ST ***very high bit rate digital subscriber line systems*** ; hybrid fiber/twisted-pair architecture; hardware design; performance analysis; ***data rates*** ; installed twisted-pair cables; twisted-pair access networks; channel model; frequency division multiplexed VDSL; QAM; carrierless AM/PM; scalable system proposals; symmetrical transmission; asymmetrical transmission; filter lengths; equalizer; signal wordlengths; adaptive filters; hardware complexity; 50 Mbit/s; 40 MHz; 12.5 Mbit/s; 800 m; 280 m; 25 Mbit/s; 300 m

L4 ANSWER 5 OF 9 INSPEC COPYRIGHT 2000 IEE

AB In a hybrid fiber/twisted-pair architecture the transmission of ***data*** ***rates*** much higher than the 1.5 or 2 Mbit/s of the high bit-rate digital ***subscriber*** ***line*** (HDSL) service can be achieved by reducing the loop length of twisted pair cables in the access network. In this paper we present a channel model for twisted-pair cables for frequencies up to 40 MHz, which is derived from ***measurements*** and theoretical analyses. Based on the new channel model the transmission capacity for a symmetrical pulse amplitude

modulation (PAM) system with adaptive echo cancellation (EC) and for a carrierless AM/PM (CAP) system based on frequency division multiplexing (FDM) is calculated, Up to a table length of 200 m the PAM system achieves higher ***data*** ***rates*** , whereas for longer distances CAP systems are advantageous, Over 200 m a ***data*** ***rate*** of about 30 Mbit/s can be transmitted by both systems with 24 identical self-crosstalk disturbers in the 50-pair distribution cable. Whereas the reach of a 25 Mbit/s echo cancellation system can be increased to 360 m by NEXT cancellation, the range of the FDM system can even be improved from 300 m to 610 m for the same ***data*** ***rate*** . Crosstalk cancellation results in a high hardware complexity but could be realized with gate arrays in 0.5 or 0.35 mu m technology.

ST transmission capacity; design; VHDSL-system; hybrid fiber/twisted-pair architecture; ***data rates*** ; ***high bit-rate digital subscriber*** *** line*** ; loop length; twisted pair cables; access network; channel model; symmetrical pulse amplitude modulation; adaptive echo cancellation; carrierless AM/PM system; CAP; frequency division multiplexing; FDM; self-crosstalk disturbers; 50-pair distribution cable; echo cancellation system; NEXT cancellation; range; crosstalk cancellation; 25 Mbit/s; 1.5 to 2 Mbit/s; 0 to 610 m; 2 to 40 MHz; 30 Mbit/s

L4 ANSWER 6 OF 9 INSPEC COPYRIGHT 2000 IEE

AB The growing demand to transmit high-speed digital data in many local area networks (LANs) and digital ***subscriber*** ***lines*** (DSLs) has resulted in a wide variety of transmission systems that have to co-exist on twisted wire copper pairs. In this paper, we address the problem of maintaining spectrum compatibility between various services that may use different transmission technologies, by shaping in an optimal manner, the power spectral density (PSD) of the transmit signal. A multitone modulation scheme such as discrete multitone (DMT) has the flexibility of optimizing the power spectrum over more than one (disjoint) frequency band, and is suitable for twisted pair subscriber loops, and other transmission media, where the optimized transmit spectrum is likely to occupy more than one frequency band. DMT has been selected by the American National Standards Institute (ANSI) T1E1.4 Standards Committee as the standard modulation scheme for asymmetric DSL (ADSL). The results presented in this paper are for the specific application of DMT to transport ADSL payloads of over 6 Mb/s from the network to the customer. We consider spectral compatibility between ADSL, the T1 repeater system, high bit-rate DSL (HDSL), and integrated services digital networks (ISDN) basic rate access (BRA) systems. The simulation results show that: 1) one can customize the transmit PSD to achieve optimum ADSL performance in a specified noise environment; 2) this optimum performance can result in as much as approximately 6 dB improvement in signal-to-noise ratio (SNR) when compared to the nonoptimized PSD chosen by the T1E1.4 committee; 3) in achieving the above improvements, the total maximum transmit power is

still consistent with the limit set by the T1E1.4 committee. Further work is required to support the simulation results with ***measured*** data. The mathematical analysis is based on the use of Lagrange multipliers to solve the constrained optimization problem, and is easily extended to other asymmetric and full-duplex wireline transmission systems operating at much higher ***data*** ***rates*** . The practicality of implementing the proposed optimization routine requires further investigation.

ST optimization; discrete multitone; spectrum compatibility; transmission systems; twisted copper pairs; high-speed digital data; LAN; ***digital*** *** subscriber lines*** ; transmission technologies; power spectral density; multitone modulation scheme; ADSL; spectral compatibility; T1 repeater system; HDSL; ISDN; noise; performance; signal-to-noise ratio; T1E1.4 committee; mathematical analysis; Lagrange multipliers

L4 ANSWER 7 OF 9 INSPEC COPYRIGHT 2000 IEE

AB JERS-1 (Japanese Earth resources satellite-1) carries an synthetic aperture radar (SAR) and optical sensors (OPS). The image ***data*** ***rate*** is very large with volumes of more than 100 MB. It is not practicable to deliver this data using public ***telephone*** ***lines*** at 9600 bit per second (bps). The authors used JPEG for data compression and INS64 for data transmission. JPEG compression algorithm is proposed as the standard color still image compression method by ISO and CCITT. It is a non-recursive compression. INS64 is one kind of ISDN (integrated services digital network). As most users think, it is important to check full scene data with a personal computer or small workstation. The JERS-1 image transmission system using data compression and ISDN network is developed. This paper describes the outline of this system and the test results of JERS-1 image data compression and on-***line*** transmission.

ST ***geophysical measurement technique*** ; satellite remote sensing; picture processing; land surface; radar optical imaging; image processing; optical image; data telemetry; real time; JERS-1; data transmission; data compression; ISDN network; synthetic aperture radar; optical sensor; JPEG; INS64; compression algorithm; color still image compression method; ISO; CCITT; integrated services digital network

L4 ANSWER 8 OF 9 INSPEC COPYRIGHT 2000 IEE

AB The EFG7515 is a general purpose monolithic DPSK and FSK modem implemented with double poly CMOS process. It is capable of generating and receiving phase modulated signals at ***data*** ***rates*** of 1200 bps or 600 bps as well as frequency modulated signals at ***data*** ***rates*** up to 300 bps on voice-grade ***telephone*** ***lines*** . It is offered in a 28 pin package capable of full-duplex operation according to three pin-selectable standards: CCITT V22 A-B; Bell 212A with its low speed mode; and Bell 103. The EFG7515 mixes digital

logic and switched capacitor techniques to provide all the necessary functions on a single chip. Results ***measured*** on a breadboard circuit are presented.

ST mixed digital/analogue circuit; frequency-shift keying; data communication equipment; phase-shift keying; monolithic IC; single chip CMOS modem; EFG7515; DPSK; FSK; double poly CMOS process; phase modulated signals; 1200 bps; 600 bps; frequency modulated signals; 300 bps; ***voice-grade*** *** telephone lines*** ; 28 pin package; full-duplex operation; pin-selectable standards; CCITT V22 A-B; Bell 212A; low speed mode; Bell 103; digital logic; switched capacitor techniques

L4 ANSWER 9 OF 9 INSPEC COPYRIGHT 2000 IEE

AB In order to characterize the local network for digital transmission, this paper describes a method based upon automatic ***measurements*** collected from an experimental network. Some results on the electrical properties of the cables (from 1 kHz up to 1 MHz) as well as on their capacity to support simultaneous digital channels (from 144 kbit/s up to 2 Mbit/s) are given. At the end, indications on the ***subscriber*** ***lines*** configurations are presented and result in the percentage of subscribers that can be reached without, or with 1 or more repeaters at a given bit rate.

ST frequency 1 kH to 1 MHz; ***data rate 144 kb/s to 2 Mb/s*** ; organisation; modelling; subscriber network; digital transmission; ***automatic measurements*** ; experimental network; electrical properties; cables; capacity; simultaneous digital channels; indications; ***subscriber lines configurations*** ; repeaters; bit rate

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(FILE 'HOME' ENTERED AT 12:34:33 ON 27 SEP 2000)

FILE 'INSPEC' ENTERED AT 12:34:47 ON 27 SEP 2000

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L1       1124 S (DATA RATE?) AND (MEASURE?)
L2        145 S L1 AND (LINE#)
L3       6643 S ((SUBSCRIBER OR TELEPHONE OR PHONE) (W) LINE#)
L4          9 S L3 AND L2
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